# TD N° 3: The Constituent Elements of Soil

**1) Find the term that defines the following statement:**

- The electrolytes help tiny soil particles (especially clay) come together and form larger clumps: Aggregation coagulation
- The polymers (large organic molecules, like humus) act like glue, linking soil particles into bigger aggregates: Aggregation flocculation
- The force that cause the sedimentation of particles: gravitational field
- The forces which can lead to either attraction or repulsion between particles: Electrostatic forces

**2) Explain the two main roles of limestone in the soil**

A physicochemical role: It acts as a binding agent in the soil.

A physiological role: It contributes to plant nutrition.

**3) How we can identify the limestone in the soil?**

Field method: By reacting a strong acid (HCl) with a soil sample.

Laboratory method: This method allows us to measure the amount of $CO_2$ released following the reaction of carbonates with 0.1N hydrochloric acid (HCl).

**4) Find the term that defines the following statement:**

- A deposit and a thin film of limestone particles around soil aggregates or along pore spaces: Pseudomycelium Form
- A compact slab that can exceed one meter in thickness, occupying a single horizon or the entire soil profile: Crusty Form
- The heterogeneous distribution of limestone particles within a horizon or throughout the entire soil profile: Diffused Form

**5) What is the difference between total limestone and active limestone?**

**Total limestone** refers to the overall calcium carbonate ($CaCO_3$) content in the soil, while **active limestone** is the fraction that is readily available to react with acids and influence soil properties, such as pH and nutrient availability.

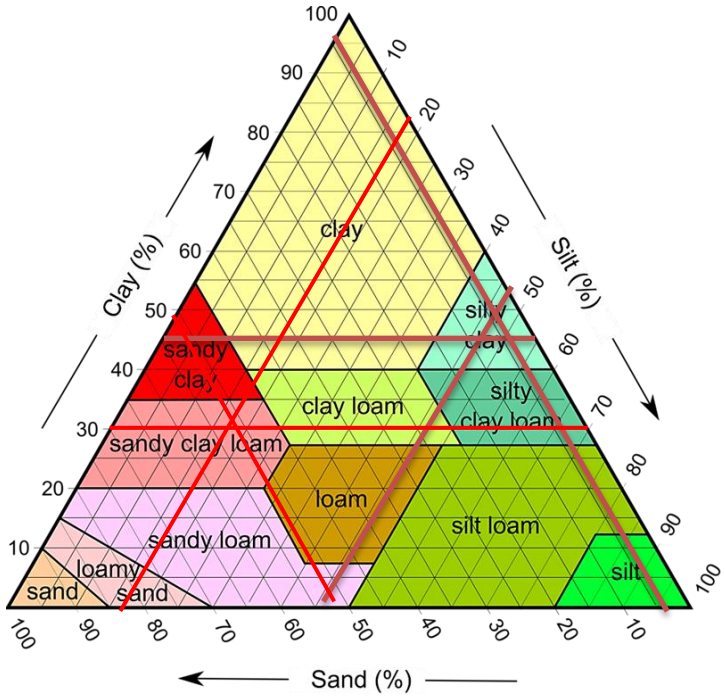
**6) Active limestone plays a crucial role in soil properties and plant growth by:**

- Increase organic matter content
- Acts as a cementing agent
- Helps increase soil acidity
- Maintaining a suitable pH for living organisms

**7) Identify the soil texture using texture triangle and it properties**

**Soil 1:** Silt: 46%, Clay: 45%, Sand: 9%

**Soil 2:** Silt: 18%, Clay: 30%, Sand: 52%




**Soil 1 : Silty clay soil**

These soils are rich in nutrients but are generally unfavorable for agriculture due to their low cohesion and poor porosity, as silt particles tend to clog soil pores.

For its high content of clay it will be with poor aeration and unfavorable physical properties: they are difficult to work when wet due to their plasticity and become compact and hard when dry.

**Soil 2: Sandy clay loam**

Sandy clay loam soil has moderate porosity and good drainage due to its sand content, but it also retains some moisture because of the clay fraction. It has moderate water retention, holding more water than sandy soils but less than clayey soils. The balance of sand, silt, and clay provides a mix of aeration and water-holding capacity, making it suitable for plant growth.